



# UNITED STATES PATENT AND TRADEMARK OFFICE

A

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,009	01/16/2004	Jiutao Li	M4065.0609/P609-D	6261
24998	7590	02/17/2006	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			FENTY, JESSE A	
2101 L Street, NW			ART UNIT	
Washington, DC 20037			PAPER NUMBER	
			2815	

DATE MAILED: 02/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/758,009

Applicant(s)

LI, JIUTAO

Examiner

Jesse A. Fenty

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-15 and 108-115 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11, 108 and 110-115 is/are rejected.
- 7) ☒ Claim(s) 12-15 and 109 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 11, 108 and 110-115, are rejected under 35 U.S.C. 102(e) as being anticipated by Dennison (US 2003/0036232 A1).

In re claim 11, Dennison (e.g., Figs. 15-16) discloses a semiconductor device, comprising

a bottom layer (300);

a chalcogenide layer (290) overlying the bottom layer;

a metal layer (300) overlying the chalcogenide layer; and

a barrier layer (310)<sup>1</sup> on the metal layer, the barrier layer having a thickness such that the barrier layer is essentially transparent to irradiation.

The limitation, “for diffusing the metal layer into the chalcogenide layer” is a recitation of the intended use of the claimed invention. Terms that simply set forth the

---

<sup>1</sup> Titanium nitride is inherently known to be transparent in this art. For reference, see Burke et al. ('929), column 8, lines 38-39; and Krisko ('18), claim 14.

Art Unit: 2815

intended use, a property inherent in or a function, do not differentiate the claimed composition of these elements from those known to prior art.

In re claim 108, Dennison discloses the device of claim 11, wherein the barrier layer is transparent to light.

In re claim 110, Dennison discloses the device of claim 11. The limitation, "reduces agglomeration ..." is intended use language that does not further differentiate the claimed structure.

In re claim 114, Dennison discloses the device of claim 11, wherein the chalcogenide layer is formed to a thickness of 600 angstroms (section [0055]).

In re claim 115, Dennison discloses the device of claim 11, wherein the bottom layer comprises a conductive material (titanium).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 110-113 rejected under 35 U.S.C. 103(a) as being unpatentable over Dennison (as above).

In re claims 110-113, Dennison discloses the device of claim 11, but does not expressly disclose the thickness of the barrier layer. However, other important thicknesses, such as that of the chalcogenide layer (290) is disclosed and comparable

Art Unit: 2815

thicknesses can be determined from that value. The barrier layer (310) is much smaller than the layer 9290) and it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the barrier layer on the order of 30 to 100 angstroms, for the purpose of allowing diffusion of the upper layer into lower layers, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F. 2c 272, 205 USPQ 215 (CCPA 1980).

While the Dennison reference appears to teach away from using layers to allow diffusion (section [0066]), Dennison does acknowledge the role of the barrier layers in relation to diffusion. It would have been obvious to one skilled in the art at the time of the invention to realize from the disclosure of Dennison that if barrier layers such as (310) are used to inhibit diffusion, then one of ordinary skill in the art would be able to make the layers thinner, especially in light of their transparent characteristics, to allow diffusion to take place.

### ***Allowable Subject Matter***

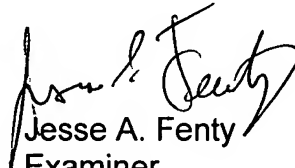
5. Claims 12-15 and 109 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse A. Fenty whose telephone number is 571-272-1729. The examiner can normally be reached on 5/4-9 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jesse A. Fenty  
Examiner  
Art Unit 2815